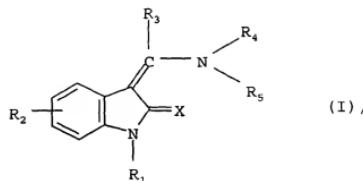


What is Claimed is:

1. Substituted indolinones of general formula

5



X denotes an oxygen or sulphur atom,

10 R₁ denotes a hydrogen atom, C₁₋₃-alkyl or hydroxy group,

R₂ denotes a hydrogen, fluorine, chlorine, bromine or iodine atom, a C₁₋₃-alkyl or nitro group,

15 R₃ denotes a phenyl or naphthyl group, each of which may be mono- or disubstituted by fluorine, chlorine, bromine or iodine atoms, by C₁₋₃-alkyl, C₁₋₃-alkoxy, carboxy, cyano, trifluoromethyl, nitro, amino, C₁₋₃-alkylamino, di-(C₁₋₃-alkyl)-amino, C₁₋₃-alkylsulphonylamino, amino-C₁₋₃-alkyl, 2-carboxy-phenylcarbonylaminomethyl, C₁₋₃-alkylamino-C₁₋₃-alkyl, C₂₋₄-alkanoylamino-C₁₋₃-alkyl, N-(C₂₋₄-alkanoyl)-

20 C₁₋₃-alkylamino-C₁₋₃-alkyl, di-(C₁₋₃-alkyl)-amino-C₁₋₃-alkyl, carboxy-C₂₋₃-alkenyl, N-(carboxy-C₁₋₃-alkyl)-aminocarbonyl, N-(carboxy-C₁₋₃-alkyl)-N-(C₁₋₃-alkyl)-amino-carbonyl or imidazolyl-C₁₋₃-alkyl groups, while the substituents may be identical or different,

R₄ denotes a hydrogen atom or a C₁₋₃-alkyl group and

R₅ denotes a phenyl or naphthyl group optionally substituted by a C₁₋₃-alkyl group, each of which may additionally be substituted in the aromatic moiety

5 by a fluorine, chlorine, bromine or iodine atom, by a C₁₋₃-alkyl, C₁₋₃-alkoxy, cyano, nitro or trifluoromethyl group,

10 by a C₁₋₃-alkoxy group which is substituted by a carboxy, aminocarbonyl, C₁₋₃-alkylaminocarbonyl or di-(C₁₋₃-alkyl)-aminocarbonyl group or in the 2 or 3 position by an amino, C₁₋₃-alkylamino, di-(C₁₋₃-alkyl)-amino, phenyl-C₁₋₃-alkylamino, N-(phenyl-C₁₋₃-alkyl)-N-(C₁₋₃-alkyl)-amino, pyrrolidino, piperidino or hexamethyleneimino group,

15 by a C₂₋₃-alkenyl group optionally substituted by a di-(C₁₋₃-alkyl)-amino group, which may additionally be substituted in the alkenyl moiety by a chlorine or bromine atom,

by a C₂₋₃-alkynyl group optionally substituted by a di-(C₁₋₃-alkyl)-amino group,

20 by a C₁₋₃-alkyl group which is substituted by a 3- to 7-membered cycloalkyleneimino group, by a dehydropiperidino, morpholino, thiomorpholino, 1-oxido-thiomorpholino, 1,1-dioxido-thiomorpholino, piperazino, N-(C₁₋₃-alkyl)-piperazino, N-(C₁₋₃-alkanoyl)-piperazino or N-(C₁₋₅-alkoxycarbonyl)-piperazino group, whilst the abovementioned substituents may be substituted by a C₁₋₃-alkyl, phenyl or phenyl-C₁₋₃-alkyl group and the abovementioned piperidino or hexamethyleneimino groups may additionally be substituted by a C₁₋₃-alkyl group or in the 3 or 4 position by a hydroxy, C₁₋₃-alkoxy, hydroxy-C₁₋₃-alkyl, carboxy, aminocarbonyl, N-(C₁₋₃-alkyl)-aminocarbonyl or N,N-di-(C₁₋₃-alkyl)-aminocarbonyl group,

by a C₁₋₃-alkyl group substituted by a hydroxy, C₁₋₃-alkoxy, carboxy or cyano group, whilst a C₁₋₃-alkyl group substituted by a carboxy group may additionally be substituted in the alkyl moiety by an amino or C₁₋₅-alkoxycarbonylamino group,

5 by an aminocarbonylamino, amidino or guanidino group optionally substituted by one or two C₁₋₃-alkyl groups,

by a piperidino, hexamethyleneimino, morpholino, piperazino or N-(C₁₋₃-alkyl)-piperazino group,

10 by a formyl, carboxy or trifluoroacetyl group,

by a carbonyl group which

15 is substituted by a C₁₋₃-alkyl, C₁₋₃-alkoxy-C₁₋₃-alkyl, amino, C₁₋₅-alkylamino or di-(C₁₋₃-alkyl)-amino group, while the abovementioned amino and C₁₋₃-alkylamino groups may additionally be substituted at the nitrogen atom by a carboxy-C₁₋₃-alkyl group or by a C₂₋₃-alkyl group which is substituted in the 2 or 3 position by a hydroxy, C₁₋₃-alkoxy, amino, C₁₋₃-alkylamino or 20 di-(C₁₋₃-alkyl)-amino group,

by a pyrrolidinocarbonyl, piperidinocarbonyl, hexamethyleneiminocarbonyl, morpholinocarbonyl, piperazinocarbonyl, N-(C₁₋₃-alkyl)-piperazinocarbonyl or N-(phenyl-C₁₋₃-alkyl)-piperazinocarbonyl group,

25 by an amidosulphonyl, pyrrolidinosulphonyl, piperidinosulphonyl or hexamethyleneiminosulphonyl group, by a C₁₋₃-alkylamidosulphonyl or di-(C₁₋₃-alkyl)-amidosulphonyl group, wherein an alkyl moiety may be substituted in each case by a carboxy, aminocarbonyl, N-(C₁₋₃-alkyl)-aminocarbonyl or N,N-di-

(C₁₋₃-alkyl)-aminocarbonyl group or, in the 2 or 3 position, by a C₁₋₃-alkylamino or di-(C₁₋₃-alkyl)-amino group,

5 by an amino, C₁₋₅-alkylamino, C₃₋₇-cycloalkylamino, phenyl-C₁₋₃-alkylamino, phenylamino, 6-membered heteroarylamino, amino-C₁₋₃-alkyl, N-(C₁₋₅-alkyl)-amino-C₁₋₃-alkyl, di-(C₁₋₅-alkyl)-amino-C₁₋₃-alkyl, C₃₋₇-cycloalkylamino-C₁₋₃-alkyl, N-(C₁₋₅-alkyl)-C₃₋₇-cycloalkylamino-C₁₋₃-alkyl, phenylamino-C₁₋₃-alkyl, N-(C₁₋₃-alkyl)-phenylamino-C₁₋₃-alkyl, phenyl-C₁₋₃-alkylamino-C₁₋₃-alkyl or N-(C₁₋₅-alkyl)-phenyl-C₁₋₃-alkylamino-C₁₋₃-alkyl group or by a 6-membered heteroarylamino-C₁₋₃-alkyl group optionally substituted at the nitrogen atom by a C₁₋₅-alkyl group, 10 while the N-alkyl moiety of the abovementioned groups may be substituted in each case by a cyano, carboxy, aminocarbonyl, C₁₋₃-alkylaminocarbonyl, di-(C₁₋₃-alkyl)-amino-carbonyl, 2-[di-(C₁₋₃-alkyl)-amino]-ethylaminocarbonyl, 3-[di-(C₁₋₃-alkyl)-amino]-propylaminocarbonyl, N-{2-[di-(C₁₋₃-alkyl)-amino]-ethyl}-N-(C₁₋₃-alkyl)-amino-carbonyl or N-{3-[di-(C₁₋₃-alkyl)-amino]-propyl}-N-(C₁₋₃-alkyl)-aminocarbonyl 15 group or in the 2 or 3 position by a hydroxy, C₁₋₃-alkoxy, amino, C₁₋₃-alkylamino, di-(C₁₋₃-alkyl)-amino, pyrrolidino, piperidino, hexamethyleneimino, morpholino, piperazino or N-(C₁₋₃-alkyl)-piperazino group and the nitrogen atom of the abovementioned amino, N-(C₁₋₅-alkyl)-amino, C₃₋₇-cycloalkylamino, phenyl-C₁₋₃-alkylamino, phenylamino, 6-membered heteroarylamino, amino-C₁₋₃-alkyl- and 20 N-(C₁₋₅-alkylamino)-C₁₋₃-alkyl groups may additionally be substituted

25 by a C₁₋₅-alkoxycarbonyl group,

by a formyl, trifluoroacetyl or benzoyl group,

by a carboxy-C₁₋₃-alkyl, aminocarbonyl-C₁₋₃-alkyl, N-(C₁₋₃-alkyl)-aminocarbonyl-C₁₋₃-alkyl or N,N-di-(C₁₋₃-alkyl)-aminocarbonyl-C₁₋₃-alkyl group,

by a C₁₋₅-alkyl group which may be substituted, except in the 1 position, by a hydroxy, C₁₋₃-alkoxy, amino, C₁₋₃-alkylamino or di-(C₁₋₃-alkyl)-amino group,

5 by a C₂₋₄-alkanoyl group which may be substituted in the alkanoyl moiety by a carboxy, hydroxy, C₁₋₃-alkoxy, phenyl, amino, phthalimido, C₁₋₃-alkylamino, di-(C₁₋₃-alkyl)-amino, pyrrolidino, piperidino, hexamethyleneimino or morpholino group or by a piperazino group optionally substituted at the nitrogen atom by a C₁₋₃-alkyl or phenyl-C₁₋₃-alkyl group, while the alkyl moiety of the

10 abovementioned C₁₋₃-alkylamino- and di-(C₁₋₃-alkyl)-amino substituents may be substituted in the 2 or 3 position by a hydroxy, C₁₋₃-alkoxy, amino, C₁₋₅-alk-oxycarbonylamino, C₁₋₃-alkylamino, di-(C₁₋₃-alkyl)-amino, phenyl, pyrrolidino, piperidino, hexamethyleneimino or morpholino group,

15 by a C₁₋₅-alkylsulphonyl group in which the alkyl moiety may be substituted except in the 1 position by a di-(C₁₋₃-alkyl)-amino, pyrrolidino, piperidino, hexamethyleneimino or morpholino group,

by a phenyl-(C₁₋₃)-alkylsulphonyl or phenylsulphonyl group optionally substituted in the phenyl moiety by a fluorine, chlorine or bromine atom or by a C₁₋₃-alkyl or C₁₋₃-alkoxy group,

20 while additionally any carboxy, amino or imino group present may be substituted by a group which can be cleaved *in vivo*,

25 the isomers and the salts thereof.

2. Substituted indolinones of general formula I according to claim 1, wherein

X denotes an oxygen or sulphur atom,

R₁ denotes a hydrogen atom, a C₁₋₃-alkyl, hydroxy, C₁₋₄-alkoxycarbonyl or C₂₋₄-alkanoyl group,

R₂ denotes a hydrogen, fluorine, chlorine, bromine or iodine atom, a C₁₋₃-alkyl or nitro group,

10 R₃ denotes a phenyl or naphthyl group, each of which may be mono- or disubstituted by fluorine, chlorine, bromine or iodine atoms, by C₁₋₃-alkyl, imidazolylmethyl, 2-carboxy-ethenyl, 2-(C₁₋₃-alkoxycarbonyl)-ethenyl, C₁₋₃-alkoxy, cyano, carboxy, C₁₋₃-alkoxycarbonyl, trifluoromethyl, nitro, amino, phthalimidomethyl, 2-carboxy-phenylcarbonylaminomethyl, C₁₋₃-alkylamino, di-(C₁₋₃-alkyl)-amino,

15 C₁₋₃-alkylsulphonylamino, amino-C₁₋₃-alkyl, C₁₋₃-alkylamino-C₁₋₃-alkyl, C₂₋₄-alkanoyl-amino-C₁₋₃-alkyl, N-(C₂₋₄-alkanoyl)-C₁₋₃-alkylamino-C₁₋₃-alkyl, di-(C₁₋₃-alkyl)-amino-C₁₋₃-alkyl, carboxy-C₁₋₃-alkylaminocarbonyl or C₁₋₃-alkoxycarbonyl-C₁₋₃-alkylaminocarbonyl groups, while the substituents may be identical or different,

20 R₄ denotes a hydrogen atom or a C₁₋₃-alkyl group and

R₅ denotes a phenyl or naphthyl group optionally substituted by a C₁₋₃-alkyl group, each of which may additionally be substituted in the aromatic moiety

25 by a fluorine, chlorine, bromine or iodine atom, by a C₁₋₃-alkyl, C₁₋₃-alkoxy, cyano, nitro or trifluoromethyl group, while the abovementioned alkyl group may simultaneously be substituted by a carboxy or C₁₋₃-alkoxycarbonyl group and an amino or C₁₋₄-alkoxycarbonylaminogroup,

a C₁-3-alkyl group which is substituted by a 4- to 7-membered cycloalkyleneimino group, by a dehydropiperidino, morpholino, thiomorpholino, 1-oxido-thiomorpholino, 1,1-dioxido-thiomorpholino, piperazino or N-(C₁-4-alkoxycarbonyl)-piperazino group, while the abovementioned piperidino, hexamethyleneimino, morpholino, thiomorpholino, 1-oxido-thiomorpholino, 1,1-dioxido-thiomorpholino- and piperazino groups may be substituted by a C₁-3-alkyl, phenyl or phenyl-C₁-3-alkyl group and the abovementioned piperidino groups may additionally be substituted by a C₁-3-alkyl group or in the 3 or 4 position by a hydroxy, C₁-3-alkoxy, hydroxy-C₁-3-alkyl, carboxy, aminocarbonyl, N-(C₁-3-alkyl)-aminocarbonyl or N,N-di-(C₁-3-alkyl)-aminocarbonyl group,

5 by a C₁-3-alkyl group optionally substituted by a hydroxy, C₁-3-alkoxy, carboxy, C₁-3-alkoxycarbonyl or cyano group,

10 by an aminocarbonylamino, amidino or guanidino group optionally substituted by one or two C₁-3-alkyl groups,

15 by a piperidino, hexamethyleneimino, morpholino, piperazino or N-(C₁-3-alkyl)-piperazino group,

20 by a formyl, carboxy, C₁-3-alkoxycarbonyl or trifluoroacetyl group,

by a carbonyl group which

25 is substituted by a C₁-3-alkyl, C₁-3-alkoxy-C₁-3-alkyl, amino, C₁-5-alkylamino or di-(C₁-3-alkyl)-amino group, while the abovementioned amino- and C₁-3-alkylamino groups may additionally be substituted at the nitrogen atom by a carboxy-C₁-3-alkyl or C₁-3-alkoxycarbonyl-C₁-3-alkyl group or by a C₂-3-alkyl

group which may be substituted in the 2 or 3 position by a hydroxy, C₁₋₃-alkoxy, amino, C₁₋₃-alkylamino or di-(C₁₋₃-alkyl)-amino group,

5 by a pyrrolidinocarbonyl, pyrrolidinosulphonyl, piperidinocarbonyl, hexamethyleneimino carbonyl, morpholinocarbonyl, piperazinocarbonyl, N-(C₁₋₃-alkyl)-piperazinocarbonyl or N-(phenyl-C₁₋₃-alkyl)-piperazinocarbonyl group,

10 by an amidosulphonyl, C₁₋₃-alkylamidosulphonyl or di-(C₁₋₃-alkyl)-amidosulphonyl group, wherein an alkyl moiety may be substituted by a carboxy, C₁₋₃-alkoxycarbonyl, aminocarbonyl, C₁₋₃-alkylaminocarbonyl or di-(C₁₋₃-alkyl)-aminocarbonyl group or in the 2 or 3 position may be substituted by an amino, C₁₋₃-alkylamino or di-(C₁₋₃-alkyl)-amino group,

15 by an amino, C₁₋₅-alkylamino, amino-C₁₋₃-alkyl, N-(C₁₋₃-alkyl)-amino-C₁₋₃-alkyl, N-(2-hydroxyethyl)-amino-C₁₋₃-alkyl, N-(3-hydroxypropyl)-amino-C₁₋₃-alkyl, di-(C₁₋₅-alkyl)-amino-C₁₋₃-alkyl, N-(C₃₋₇-cycloalkyl)-amino-C₁₋₃-alkyl, N-(C₃₋₇-cycloalkyl)-N-(C₁₋₃-alkyl)-amino-C₁₋₃-alkyl or N-(phenyl-C₁₋₃-alkyl)-amino-C₁₋₃-alkyl group, while the N-alkyl moiety of the abovementioned groups may be substituted by a cyano, carboxy, C₁₋₃-alkylcarbonyl, aminocarbonyl, C₁₋₃-alkylaminocarbonyl, di-(C₁₋₃-alkyl)-aminocarbonyl, 2-[di-(C₁₋₃-alkyl)-amino]-ethylaminocarbonyl, 3-[di-(C₁₋₃-alkyl)-amino]-propylaminocarbonyl, N-(2-[di-(C₁₋₃-alkyl)-amino]-ethyl)-N-(C₁₋₃-alkyl)-aminocarbonyl or N-(3-[di-(C₁₋₃-alkyl)-amino]-propyl)-N-(C₁₋₃-alkyl)-aminocarbonyl group or may be 20 substituted in the 2 or 3 position by a hydroxy, C₁₋₃-alkoxy, amino, C₁₋₃-alkylamino, di-(C₁₋₃-alkyl)-amino or morpholino group, while the nitrogen atom of the abovementioned amino, C₁₋₃-alkylamino, amino-C₁₋₃-alkyl or N-(C₁₋₅-alkylamino)-C₁₋₃-alkyl moieties may additionally be substituted

25

by a C₁₋₅-alkoxycarbonyl group,

5 by a formyl, trifluoroacetyl or benzoyl group,

by a C₁₋₅-alkyl group which may be substituted, except in the 1 position, by a hydroxy, C₁₋₃-alkoxy, amino, C₁₋₃-alkylamino or di-(C₁₋₃)-alkylamino group,

10 by a C₂₋₄-alkanoyl group which may be substituted in the alkanoyl moiety by a hydroxy, C₁₋₃-alkoxy, amino, C₂₋₄-alkanoylamino, C₁₋₅-alkoxycarbonylamino, phthalimido, C₁₋₃-alkylamino, di-(C₁₋₃-alkyl)-amino, N-(C₁₋₃-alkyl)-phenylamino, pyrrolidino, piperidino or morpholino group or by a piperazino group optionally substituted at the nitrogen atom by a C₁₋₃-alkyl or phenyl-C₁₋₃-alkyl group, while the N-alkyl moiety of the abovementioned groups may be substituted in the 2 or 3 15 position by a methoxy, di-(C₁₋₃-alkyl)-amino or morpholino group,

by a C₁₋₅-alkylsulphonyl group in which the alkyl moiety may be substituted, except in the 1 position, by a di-(C₁₋₃-alkyl)-amino, pyrrolidino, piperidino, hexamethyleneimino or morpholino group,

20 by a pyridinyl or pyrimidinyl group,

by a phenyl, phenyl-(C₁₋₃)-alkylsulphonyl or phenylsulphonyl group optionally substituted in the phenyl moiety by a C₁₋₃-alkyl group,

25 by a C₁₋₃-alkoxy group which is substituted by a carboxy, C₁₋₃-alkoxycarbonyl, aminocarbonyl, C₁₋₃-alkylaminocarbonyl or di-(C₁₋₃-alkyl)-aminocarbonyl group or is substituted in the 2 or 3 position by an amino, C₁₋₃-alkylamino, di-(C₁₋₃-alkyl)-amino,

N-(C₁₋₃-alkyl)-N-(phenyl-C₁₋₃-alkyl)-amino, piperidino or hexamethyleneimino group,

5 by a prop-1-enyl, 2-chloro-prop-1-enyl or prop-1-ynyl group which is substituted in the 3 position by a di-(C₁₋₃-alkyl)-amino group,

the isomers and the salts thereof.

3. Substituted indolinones of general formula I according to claim 1, wherein

10

X denotes an oxygen atom,

R₁ denotes a hydrogen atom, a C₁₋₃-alkyl, C₁₋₄-alkoxycarbonyl or C₂₋₄-alkanoyl group,

15 R₂ denotes a hydrogen, fluorine, chlorine, bromine or iodine atom, a C₁₋₃-alkyl or nitro group,

20 R₃ denotes a phenyl group which may be mono- or disubstituted by fluorine, chlorine, bromine or iodine atoms, by C₁₋₃-alkyl, trifluoromethyl, imidazolylmethyl, 2-carboxy-ethenyl, 2-C₁₋₃-alkoxycarbonyl-ethenyl, C₁₋₃-alkoxy, cyano, carboxy, C₁₋₃-alkoxycarbonyl, nitro, amino, phthalimidomethyl, 2-carboxy-benzoylaminomethyl, C₁₋₃-alkylamino, di-(C₁₋₃-alkyl)-amino, C₁₋₃-alkylsulphonylamino, amino-C₁₋₃-alkyl, C₁₋₃-alkylamino-C₁₋₃-alkyl, C₂₋₄-alkanoylamino-C₁₋₃-alkyl, N-(C₂₋₄-alkanoyl)-C₁₋₃-alkylamino-C₁₋₃-alkyl, di-(C₁₋₃-alkyl)-amino-C₁₋₃-alkyl, carboxy-C₁₋₃-alkylaminocarbonyl or C₁₋₃-alkoxycarbonyl-C₁₋₃-alkylaminocarbonyl groups, while the substituents may be identical or different,

25 R₄ denotes a hydrogen atom or a C₁₋₃-alkyl group and

R₅ denotes a phenyl or naphthyl group optionally substituted by a C₁₋₃-alkyl group, each of which may additionally be substituted in the aromatic moiety

5 by a fluorine, chlorine, bromine or iodine atom, by a C₁₋₃-alkoxy, cyano, nitro or trifluoromethyl group,

10 a C₁₋₃-alkyl group which is substituted by a 4- to 7-membered cycloalkyleneimino group, by a dehydropiperidino, morpholino, thiomorpholino, 1-oxido-thiomorpholino, 1,1-dioxido-thiomorpholino, piperazino or N-(C₁₋₄-alkoxycarbonyl)-piperazino group, while the abovementioned piperidino, hexamethyleneimino, morpholino and piperazino groups may be substituted by a C₁₋₃-alkyl, phenyl or phenyl-C₁₋₃-alkyl group and the abovementioned piperidino groups may additionally be substituted by a C₁₋₃-alkyl group or may be substituted in the 3 or 4 position by a hydroxy, C₁₋₃-alkoxy, hydroxy-C₁₋₃-alkyl, carboxy, aminocarbonyl, N-(C₁₋₃-alkyl)-aminocarbonyl or N,N-di-(C₁₋₃-alkyl)-aminocarbonyl group,

15 by a C₁₋₃-alkyl group optionally substituted by a hydroxy, C₁₋₃-alkoxy, carboxy, C₁₋₃-alkoxycarbonyl or cyano group,

20 by an aminocarbonylamino, amidino or guanidino group optionally substituted by one or two C₁₋₃-alkyl groups,

25 by a piperidino, hexamethyleneimino, morpholino, piperazino or N-(C₁₋₃-alkyl)-piperazino group,

by a formyl, carboxy, C₁₋₃-alkoxycarbonyl or trifluoroacetyl group,

by a carbonyl group which

is substituted by a C₁₋₃-alkyl, C₁₋₃-alkoxy-C₁₋₃-alkyl, amino, C₁₋₅-alkylamino or di-(C₁₋₃-alkyl)-amino group, while the abovementioned amino and C₁₋₃-alkylamino groups may additionally be substituted at the nitrogen atom by a carboxy-C₁₋₃-alkyl, C₁₋₃-alkoxycarbonyl-C₁₋₃-alkyl or C₁₋₃-alkoxycarbonyl-C₁₋₃-alkyl group or by a C₂₋₃-alkyl group which may be substituted in the 2 or 3 position by a hydroxy, C₁₋₃-alkoxy, amino, C₁₋₃-alkylamino or di-(C₁₋₃-alkyl)-amino group,

5 by a pyrrolidinocarbonyl, pyrrolidinosulphonyl, piperidinocarbonyl or hexamethyleneimino carbonyl group,

10 by an amidosulphonyl, C₁₋₃-alkylamidosulphonyl or di-(C₁₋₃-alkyl)-amidosulphonyl group, wherein an alkyl moiety may be substituted by a carboxy, C₁₋₃-alkoxycarbonyl or dimethylaminocarbonyl group or in the 2 or 3 position by a dimethylamino group,

15 by a straight-chain C₁₋₂-alkyl group which is terminally substituted by an amino, benzylamino, pyridylamino or pyrimidylamino group, by a C₁₋₄-alkylamino group in which the alkyl moiety may be substituted in position 2, 3 or 4 by a hydroxy or methoxy group, or by a C₁₋₂-alkylamino group substituted in the C₁₋₂-alkyl moiety by a carboxy, C₁₋₃-alkoxycarbonyl or di-(C₁₋₃-alkyl)-aminocarbonyl group, while in the abovementioned groups any hydrogen atom present at the amino nitrogen atom may 20 additionally be replaced

25 by a C₃₋₆-cycloalkyl group, by a C₁₋₄-alkyl group in which the alkyl moiety may be substituted in position 2, 3 or 4 by a hydroxy group, by a C₁₋₂-alkylcarbonyl group optionally substituted by a methoxy, carboxy, C₁₋₃-alkoxycarbonyl, amino, methylamino, dimethylamino, acetyl amino, C₁₋₅-alkoxycarbonylamino, N-methyl-C₁₋₅-alkoxycarbonylamino or morpholinocarbonylamino group, by a

C₁₋₅-alkoxycarbonyl, C₁₋₄-alkylsulphonyl, phenylsulphonyl or tolylsulphonyl group,

by a 3-dimethylaminopropyl or 3-dimethylamino-prop-1-enyl group,

5

by an ethyl group which is substituted in the 1 position by an amino or C₁₋₅-alkoxycarbonylamino group,

10 by an ethyl group which is substituted in the 2 position by an amino or C₁₋₅-alkoxycarbonylamino group and by a carboxy or C₁₋₃-alkoxycarbonyl group,

15 by an amino or C₁₋₃-alkylamino group in which the alkyl moiety may be substituted by a cyano, carboxy, C₁₋₃-alkoxycarbonyl, aminocarbonyl, methylaminocarbonyl or dimethylaminocarbonyl group or may be substituted in the 2 or 3 position by an amino, methylamino, dimethylamino, acetylamino, N-methyl-acetylamino or morpholino group, by an N-(C₁₋₃-alkyl)-aminocarbonyl or N-(C₁₋₃-alkyl)-methylaminocarbonyl group optionally substituted in the 2 or 3 position of the C₁₋₃-alkyl moiety by a dimethylamino group, while any hydrogen atom present at the amino nitrogen atom in the abovementioned groups may additionally be replaced

20

by a formyl, trifluoroacetyl, benzoyl, C₁₋₄-alkoxycarbonyl or C₁₋₄-alkylaminocarbonyl group,

25

by a C₂₋₄-alkanoyl group which may be terminally substituted by an amino, acetylamino, C₁₋₄-alkoxycarbonylamino, pyrrolidino, piperidino, morpholino, piperazino, 4-methylpiperazino, 4-benzylpiperazino or phthalimido group or by a C₁₋₃-alkylamino, N-acetyl-C₁₋₃-alkyl-amino or di-(C₁₋₃-alkyl)-amino group, while in the abovementioned C₁₋₃-alkylamino, N-acetyl-C₁₋₃-alkyl-amino- and di-(C₁₋₃-alkyl)-amino groups any C₁₋₃-alkyl moiety may additionally be

substituted by a phenyl group or in the 2 or 3 position by a methoxy, dimethylamino or morpholino group,

5 by a C₁₋₄-alkylsulphonyl group in which the alkyl moiety may additionally be substituted in the 2 or 3 position by a dimethylamino, piperidino or morpholino group,

by a phenylsulphonyl or toluenesulphonyl group,

10 by a C₁₋₃-alkoxy group which is substituted by a carboxy, C₁₋₃-alkoxycarbonyl, aminocarbonyl, methylaminocarbonyl or dimethylaminocarbonyl group or is substituted in the 2 or 3 position by an amino, methylamino, dimethylamino, N-methyl-benzylamino, piperidino or hexamethyleneimino group,

15 by a C₁₋₃-alkylaminocarbonyl or di-(C₁₋₃-alkyl)-aminocarbonyl group wherein a C₁₋₃-alkyl moiety may be substituted in the 2 or 3 position by a methoxy or dimethylamino group,

the isomers and the salts thereof.

20 4. Substituted indolinones of general formula I according to claim 1, wherein

X denotes an oxygen atom

25 R₁ denotes a hydrogen atom,

R₂ denotes a hydrogen, chlorine or bromine atom, a methyl or nitro group,

R₃ denotes a phenyl group which may be substituted by a fluorine, chlorine or bromine atom, by a methyl, methoxy, aminomethyl, acetylaminomethyl, carboxy, methoxycarbonyl or imidazolylmethyl group,

5 R₄ denotes a hydrogen atom,

R₅ denotes a phenyl group which may be substituted

10 by a fluorine, chlorine or bromine atom, by a methyl, methoxy, nitro, cyano or trifluoromethyl group,

15 by a methyl or ethyl group, each of which is substituted by a carboxy, C₁₋₃-alkoxycarbonyl, cyano, azetidin-1-yl, pyrrolidino, piperidino, 4-phenylpiperidino, 3,6-dihydro-2H-pyridin-1-yl, hexamethyleneimino, morpholino, thiomorpholino, 1-oxido-thiomorpholino, piperazino, 4-methylpiperazino or 4-acetyl piperazino group, while the abovementioned piperidine groups may additionally be substituted by one or two methyl groups or may be substituted in the 3 or 4 position by a hydroxy, methoxy, carboxy, hydroxymethyl, C₁₋₃-alkoxycarbonyl, aminocarbonyl, methylaminocarbonyl or dimethylaminocarbonyl group,

20 by a straight-chain C₁₋₂-alkyl group which may be terminally substituted by an amino or benzylamino group, by a C₁₋₄-alkylamino group in which the alkyl moiety in positions 2, 3 or 4 is substituted by a hydroxy or methoxy group, by a C₁₋₂-alkylamino group substituted in the C₁₋₂-alkyl moiety by a carboxy, C₁₋₃-alkoxycarbonyl or dimethylaminocarbonyl group, while in the abovementioned groups a hydrogen atom present at the amino nitrogen may additionally be replaced

25 by a C₃₋₆-cycloalkyl group, by a C₁₋₄-alkyl group in which the alkyl moiety may be substituted in positions 2, 3 or 4 by a hydroxy group, or by a C₁₋₂-alkylcarbo-

nyl group optionally substituted by an amino, methylamino or dimethylamino group,

5 by a 3-dimethylamino-prop-1-enyl group,

by an ethyl group which is substituted in the 1-position by an amino or C₁₋₄-alkoxycarbonylamino group,

10 by an amino or C₁₋₃-alkylamino group in which the alkyl moiety may be terminally substituted by a carboxy, aminocarbonyl, methylaminocarbonyl or dimethylaminocarbonyl group or in the 2 or 3 position by an amino, methylamino, dimethylamino, acetyl amino, N-acetyl-methylamino or morpholino group or by an N-(C₁₋₃-alkyl)-aminocarbonyl or N-(C₁₋₃-alkyl)-methylaminocarbonyl group 15 optionally substituted in the 2 or 3 position by a dimethylamino group, while a hydrogen atom present at the amino nitrogen in the abovementioned groups may additionally be substituted

by a formyl or benzoyl group,

20 by a C₂₋₄-alkanoyl group which may be terminally substituted by an amino, acetyl amino, pyrrolidino, piperidino, morpholino, piperazino or 4-methylpiperazino group or by a C₁₋₃-alkylamino, N-acetyl-C₁₋₃-alkylamino or di-(C₁₋₃-alkyl)-amino group, while in the abovementioned C₁₋₃-alkylamino, N-acetyl-C₁₋₃-alkylamino or di-(C₁₋₃-alkyl)-amino groups a C₁₋₃-alkyl moiety 25 may additionally be substituted in the 2 or 3 position by a methoxy, dimethylamino or morpholino group,

by a C₁₋₄-alkylsulphonyl group which may be substituted in the 2 or 3 position by a dimethylamino group,

by a pyrrolidinosulphonyl group, an aminosulphonyl, C₁₋₃-alkylaminosulphonyl or di-(C₁₋₃-alkyl)-aminosulphonyl group, wherein in each case a C₁₋₃-alkyl moiety may be substituted by a carboxy, C₁₋₃-alkoxycarbonyl, aminocarbonyl, methylaminocarbonyl or dimethylaminocarbonyl group or, except in the 1 position, by a dimethylamino group,

5

by a C₂₋₃-alkoxy group which is substituted in the 2 or 3 position by a dimethylamino or piperidino group,

10

by an aminocarbonyl, C₁₋₃-alkylaminocarbonyl or di-(C₁₋₃-alkyl)-aminocarbonyl group, wherein in each case the C₁₋₃-alkyl moieties may be substituted by a methoxy or dimethylamino group, except in the 1 position,

15

the isomers and the salts thereof.

5. Substituted indolinones of general formula I according to claim 1, wherein

X and R₂ to R₄ are as hereinbefore defined,

20

R₁ denotes a hydrogen atom and

R₅ denotes a phenyl group which may be substituted

25

by a methyl or ethyl group, each of which is substituted by an azetidin-1-yl, pyrrolidino, piperidino, hexamethyleneimino, morpholino, 1-oxido-thiomorpholino, piperazino, 4-methylpiperazino or 4-acetyl piperazino group, while the abovementioned piperidino groups may additionally be substituted by one or two methyl groups or in the 4 position may be substituted by a hydroxy, methoxy, hydroxymethyl, aminocarbonyl, methylaminocarbonyl or dimethylaminocarbonyl group,

30

by a straight-chain C₁₋₂-alkyl group which is terminally substituted by an amino group or by a C₁₋₃-alkylamino group, while the alkyl moiety of the C₁₋₃-alkylamino group may be substituted in positions 2 or 3 by a hydroxy or methoxy group and in the abovementioned groups the hydrogen atom present at the amino nitrogen may

5 additionally be replaced

by a C₃₋₆-cycloalkyl group, by a C₁₋₃-alkyl group in which the alkyl moiety in positions 2 or 3 may be substituted by a hydroxy group, or by a C₁₋₂-alkylcarbonyl group substituted by an amino, methylamino or

10 dimethylamino group,

by an ethyl group substituted in the 1 position by an amino group,

by an amino or C₁₋₃-alkylamino group in which the alkyl moiety may be terminally

15 substituted by a carboxy, aminocarbonyl, methylaminocarbonyl, dimethylaminocarbonyl, N-(2-dimethylamino-ethyl)-aminocarbonyl or N-(2-dimethylamino-ethyl)-N-methyl-aminocarbonyl group or may be substituted in the 2 or 3 position by an amino, methylamino, dimethylamino, acetylamino, N-acetyl-methylamino or morpholino group, while the hydrogen atom present at the amino

20 nitrogen of the abovementioned groups may additionally be replaced

by a C₂₋₄-alkanoyl group which may be terminally substituted by an amino, acetylamino, pyrrolidino, piperidino, morpholino, piperazino or 4-methylpiperazino group or by a C₁₋₃-alkylamino, N-acetyl-C₁₋₃-alkylamino or di-(C₁₋₃-alkyl)-amino group, while in the abovementioned C₁₋₃-alkylamino, N-acetyl-C₁₋₃-alkylamino or di-(C₁₋₃-alkyl)-amino groups a C₁₋₃-alkyl moiety may additionally be substituted in the 2 or 3 position by a methoxy, dimethylamino or morpholino group,

by a C₁-4-alkylsulphonyl group which may be substituted in the 2 or 3 position by a dimethylamino group,

5 by a pyrrolidinosulphonyl group, an aminosulphonyl, C₁-3-alkylaminosulphonyl or di-(C₁-3-alkyl)-aminosulphonyl group, wherein in each case a C₁-3-alkyl moiety may be substituted by a carboxy, methoxycarbonyl, aminocarbonyl, methylaminocarbonyl or dimethylaminocarbonyl group or, except in the 1 position, by a dimethylamino group,

10 by a C₁-3-alkoxy group substituted in the 2 or 3 position by a dimethylamino or piperidino group,

15 by an aminocarbonyl, C₁-3-alkylaminocarbonyl or di-(C₁-3-alkyl)-aminocarbonyl group, wherein in each case a C₁-3-alkyl moiety may be substituted by a methoxy or dimethylamino group, except in the 1 position,

the isomers and the salts thereof.

6. The following compounds of general formula I:

20 (a) (Z)-3-[1-(4-dimethylaminomethyl-phenylamino)-1-phenyl-methylidene]-5-nitro-2-indolinone,

(b) (Z)-3-[1-(4-piperidinomethyl-phenylamino)-1-phenyl-methylidene]-5-nitro-2-indolinone,

25 (c) (Z)-3-{1-[4-(2-morpholinoethyl)-phenylamino]-1-phenyl-methylidene}-5-nitro-2-indolinone,

(d) (Z)-3-{1-[4-(2-dimethylamino-ethyl)-phenylamino]-1-phenyl-methylidene}-5-nitro-2-indolinone and

(e) (Z)-3-{1-[4-(N-(2-dimethylamino-ethyl)-N-methylsulphonyl-amino)-phenylamino]-1-phenyl-methylidene}-2-indolinone

5 and the salts thereof.

7. Physiologically acceptable salts of the compounds according to claims 1 to 6.

8. Pharmaceutical compositions containing a compound of general formula I according to
10 at least one of claims 1 to 6
wherein R₁ denotes a hydrogen atom, a C₁₋₃-alkyl group or a prodrug group or a
physiologically acceptable salt thereof,
optionally together with one or more inert carriers and/or diluents.

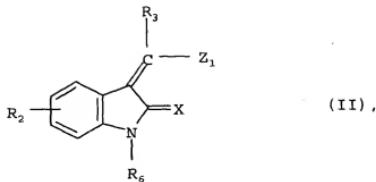
15 9. Use of a compound of general formula I according to at least one of claims 1 to 6,
wherein R₁ denotes a hydrogen atom, a C₁₋₃-alkyl group or a prodrug group or a
physiologically acceptable salt thereof, for preparing a pharmaceutical composition which
is suitable for treating excessive or anomalous cell proliferation.

20 10. Process for preparing a pharmaceutical composition according to claim 8,
characterised in that a compound of formula I according to at least one of claims 1 to 6
wherein R₁ denotes a hydrogen atom, a C₁₋₃-alkyl group or a prodrug group or a
physiologically acceptable salt thereof is incorporated in one or more inert carriers and/or
diluents by a non-chemical method.

25

11. Process for preparing the compounds according to claims 1 to 7, characterised in that

a. a compound of general formula



wherein

X, R₂ and R₃ are defined as in claims 1 to 6,

R₆ denotes a hydrogen atom, a protecting group for the nitrogen atom of the lactam group
5 or a bond to a solid phase and

Z₁ denotes a halogen atom, a hydroxy, alkoxy or aralkoxy group,

is reacted with an amine of general formula

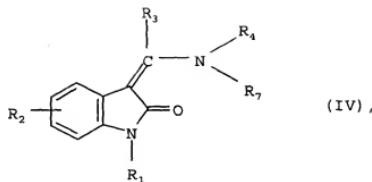
10



wherein

R₄ and R₅ are defined as in claims 1 to 6, and if necessary any protecting group used for
the nitrogen atom of the lactam group is cleaved, or a compound thus obtained is cleaved
15 from a solid phase, or

b. in order to prepare a compound of general formula I which contains an aminomethyl
group and wherein X denotes an oxygen atom, a compound of general formula



(IV),

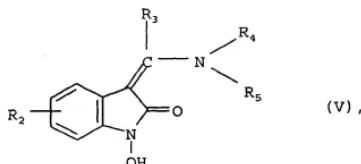
wherein

R₁ to R₄ are defined as in claims 1 to 6 and

R₇ has the meanings given for R₅ in claims 1 to 5, with the proviso that R₅ contains a

5 cyano group, is reduced, or

c. in order to prepare a compound of general formula I wherein R₁ denotes a hydrogen atom and X denotes an oxygen atom, a compound of general formula



(V),

10

wherein

R₂ to R₅ are defined as in claims 1 to 6, is reduced and

subsequently, if desired, a compound of general formula I thus obtained which contains an
15 alkoxycarbonyl group is converted by hydrolysis into a corresponding carboxy compound,
or

a compound of general formula I thus obtained which contains an amino or alkylamino
group is converted by alkylation or reductive alkylation into a corresponding alkylamino or
20 dialkylamino compound or

a compound of general formula I thus obtained which contains an amino or alkylamino group is converted by acylation into a corresponding acyl compound, or

5 a compound of general formula I thus obtained which contains a carboxy group is converted by esterification or amidation into a corresponding ester or aminocarbonyl, or

a compound of general formula I thus obtained wherein R₃ denotes a phenyl group which contains a chlorine, bromine or iodine atom is converted into a corresponding alkenylated

10 compound by reacting with an alkenyl compound, or

a compound of general formula I thus obtained wherein R₃ denotes a phenyl group which contains a chlorine, bromine or iodine atom is converted into a corresponding alkenylated compound by reacting with an alkynyl compound, and

15 if necessary any protecting group used to protect reactive groups during the reactions is cleaved or

if desired a compound of general formula I thus obtained is subsequently resolved into the

20 stereoisomers therefor

a compound of general formula I thus obtained is converted into the salts thereof, in particular for pharmaceutical use into the physiologically acceptable salts thereof with an inorganic or organic acid or base.